

REMARKS

Claim Amendment:

Claim 2 has been amended to correct an inadvertent error.

Problems Overcome by the Present Invention:

A surfactant is ordinarily used in emulsion polymerization of fluoroolefins for preparing a fluoropolymer. When a large amount of surfactant is used, the number of polymer particles generated in the initial period of emulsion polymerization increases, the polymerization speed increases, and the production efficiency of the fluoropolymer is improved. On the other hand, in a conventional process using a linear chain aliphatic sulfonate surfactant as a substitute for expensive ammonium perfluorooctanoate generally used in emulsion polymerization, the subject process is problematic in that only a small number of particles is generated.

The present invention solves the above-noted problem of the prior art by providing a process for preparing a fluoropolymer, in which polymerization can be carried out in the presence of a small amount of a branched surfactant represented by formula (1), and where the surfactant is preferably represented by formula (2). See pages 1-3 of the specification.

Fig. 1 of the present specification shows that even if the concentration of surfactant is low, Examples 1 to 8 employing a secondary alkanesulfonate Na salt were found to generate a larger number of particles than Comparative Examples 8 to 13 employing sodium n-octanesulfonate, sodium laurylsulfonate, sodium n-decanesulfonate or sodium n-undecanoate.

Patentability Over WO 02/28925 (Tang) in view of US 6,395,701 (Connor et al):

Claims 1-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 02/28925 A2 to Tang et al in view of U.S. Patent 6,395,701 to Connor et al.

Tang was cited as disclosing a process for preparing a fluoropolymer containing at least one kind of fluoroolefin, which comprises carrying out polymerization in the presence of a hydrocarbon surfactant. The Examiner relied on Connor et al as disclosing branched surfactants for use in surfactant systems, which surfactants are said to be within the scope of the present claims. The Examiner further considered that one skilled in the art would have understood that branched surfactants exhibit certain properties beneficial for the polymerization processes taught by Tang et al. The reason for rejection was that it would have been obvious to substitute the linear surfactant of Tang et al with the branched surfactant of Connor so as to simplify processing and to improve the polymerization process.

Applicants traverse, and respectfully request the Examiner to reconsider for the following reasons.

Tang discloses use of a hydrocarbon sulfonate anionic surfactant having a specific formula in the process of preparing a fluoropolymer. The branched surfactant of the present invention differs from the surfactant of Tang which is in the form of a linear chain.

In more detail, Tang et al discloses polymerization of monomer mixtures comprising a fluoroolefin in the presence of a linear hydrocarbon sulfonate surfactant represented by the formula $\text{CH}_3-(\text{CH}_2)_n-\text{SO}_3\text{M}$ where n is an integer of from 6 to 17 and M is a cation having a valence of 1 (page 2, lines 25-27 and claims 1, 11, 25, 34, 35 and 44 of Tang et al). There is no disclosure or even mention of the use of a *branched* surfactant, let alone one having the specific structural formula represented by formula (1) of present claim 1.

Connor et al relates to fatty acids, soaps, surfactant systems and consumer products based on branched 17-carbon fatty acids. There is no disclosure in Connor et al of carrying out polymerization in the presence of a fatty acid surfactant disclosed therein, let alone a process for

preparing a fluoropolymer. Particularly, the only place where Connor et al mentions polymerization is in relation to polymeric dye transfer inhibiting agents (col. 72), but this disclosure has nothing to do with polymerization in the presence of a surfactant of Connor et al. Moreover, there is no disclosure or mention in Connor et al of a fluoropolymer or fluoroolefin or even fluorine.

The Examiner considered that one skilled in the art would have understood that branched surfactants shown to have unusual properties would be beneficial for the polymerization processes taught by Tang et al. If that were the case, then Tang et al would disclose and/or would also have utilized branched hydrocarbon sulfonates. However, there is no such disclosure in Tang et al.

That is, there is no apparent reason in the prior art which would lead one ordinary skill to employ a fatty acid surfactant used by Connor et al (for preparing consumer products, with no mention of polymerization in the presence of the surfactant and no disclosure or mention of a fluoropolymer or fluoroolefin or even fluorine), in the fluoropolymerization of Tang.

From a different perspective, the Examiner considered that the present invention is obvious over Tang in view of Connor et al, because Connor et al is said to disclose the surfactant that is defined in the present claims.

Even if that is the case, the problem solved by Tang is to provide a process for preparing a fluoropolymer, in which certain specific linear hydrocarbon sulfonate surfactants may be used. That is, Tang does not disclose the specific means for carrying out polymerization in the presence of a small amount of a surfactant with excellent production efficiency as in the present invention.

On the other hand, Connor et al does not teach or suggest that the surfactant described therein can be used in a process for preparing a fluoropolymer so as to achieve excellent production efficiency. This is because the surfactant in Connor is used with the aim of improving consumer products ranging from personal care products to cosmetics and paper products, especially laundry detergent and cleaning products.

That is, there is nothing in the prior art that would lead one of ordinary skill to employ a surfactant of Connor et al, which reference has nothing to do with emulsion polymerization of fluoropolymers, in the method of Tang which calls for a hydrocarbon sulfonate ionic surfactant of a specific formula. Therefore, it is respectfully submitted that the present claims are patentable over Tang in view of Connor et al, and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-5 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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